REMARKS

Informality:

In the recent Office Action, the Examiner objected to Claims 1 and 8 due to the inclusion of the term "may be", stating that it was not a positive limitation. Claims 1 and 8 have been amended to address the objection and provide a positive limitation.

Amendment of the Terms "Drill Pipe" and "Drill Pipes":

In reviewing the claims currently on file, the Applicant noted that a number of the claims refer to "drill pipe". As the disclosure makes abundantly clear, however, the connector of the present invention can be employed with any type of threaded tubular housing, including drill pipe and drill collars. For example, page 13, lines 20 to 24, of the disclosure states as follows: "The description will be made in reference to the invention being used to connect electrical equipment mounted concentrically within drill collars or drill pipes, for drilling boreholes in the earth, although the invention has application in electrically connecting any mating members." In addition, the disclosure makes reference to "threaded members" (page 5, line 4) and "joining members" (page 18, line 7), suggesting the breadth of application.

The Applicant has accordingly amended Claims 5, 8, 11, 13, and 15 to 19, where the terms "drill pipe" or "drill pipes" were previously employed. References to "drill pipe" or "drill pipes" in these claims have been amended to refer, respectively, to "threaded tubular housing" or "threaded tubular housings". It is submitted that this terminology provides greater clarity and is more consistent with the disclosure. New Claims 23 to 28 claim the subject-matter where the threaded tubular housing is specifically a drill pipe or drill collar.

Claims Rejections:

The Examiner rejected Claims 1 to 7 under 35 U.S.C. 102(b) as being anticipated by Buck (United States Patent No. 3,508,188). Claim 7 has accordingly been cancelled, on a without prejudice basis. However, it is believed that the amended Claims 1 to 4

fully address the rejection. In addition, the Examiner does not provide explicit support for the rejection of the subject-matter of Claims 5 and 6 in the Office Action, and it is submitted that Buck does not anticipate the subject-matter of Claims 5 and 6.

Claim 1, and Claims 2 to 4 depending therefrom, comprise an elongate male member "having a plurality of electrical contacts about an outer periphery thereof". As amended, Claim 1, and Claims 2 to 4 depending therefrom, comprise the additional element of "said plug and socket means are each rotatable relative to each other". Buck discloses, as can be seen in Figures 1A, 1B, 2, 5 and 6, a first connector having two mating portions rotatable relative to each other, but not having a plurality of electrical contacts about an outer periphery of the male mating portion; this first connector only has a single electrical contact. Buck also discloses, as can be seen in Figures 3 and 4, a second connector comprising two electrical contacts, but the mating portions are not rotatable with respect to each other; instead, they are mated using a locking collar, and the rotatability feature is lost. Buck does not teach a connector wherein the plug and socket means are each rotatable relative to each other, the male portion having a plurality of electrical contacts about an outer periphery thereof, nor does Buck suggest combining such features in a single connector. It is therefore submitted that Buck does not anticipate Claims 1 to 4 as amended herein.

Claim 5 (as amended, including the "threaded tubular housing" terminology change) is addressed to the subject-matter of the original Claim 1 with the additional element of: "said plug means are adapted for positioning within an interior of a first threaded tubular housing proximate an end thereof, said end of said threaded tubular housing adapted for mating engagement with a mating end of another threaded tubular housing, and said socket means adapted for positioning within an interior of said another threaded tubular housing proximate said mating end thereof; and said male member is adapted for insertion in said receptacle means upon said first threaded tubular housing being fitted in mating engagement with said another threaded tubular housing." It is submitted that the connector of Buck is explicitly not adapted for positioning within an interior of threaded tubular housings such as drill pipe or drill collars. In fact, the connector of Buck would suffer a loss of utility if employed in such a context.

To begin with, the connector of Buck is a quick-disconnect connector, created to address the specific context of underwater electrical cables and the need for a quick disconnection means in emergency situations, such as where it is necessary to jettison equipment from deep submergence vehicles where there is insufficient time to disconnect electrical power from the equipment. As such, it neither teaches nor suggests any manner of adapting the quick-disconnect connector to a drill pipe/collar context, nor does it suggest that such an adaptation would be desirable in any sense. Such an adaptation would in fact teach away from the disclosure of Buck, as to house such a quick-disconnect connector within mated drill pipe/collar would render the connector very difficult to access to enable disconnection.

Furthermore, drill pipe/collar sections are usually connected by rotating the uppermost section relative to the lowermost section, thereby threading them together, which connection requires numerous full rotations of the uppermost section to achieve. Buck, in contrast, teaches a connector specifically designed to be quickly disconnected in underwater emergency situations, and to that end discloses a simple key-and-slot connection to enable both quick connection and quick disconnection (column 3, lines 13 to 15 and 26 to 29):

> When the two connector halves are to be joined they are aligned by inserting the alignment key 26 in the slot 39.
>
> ...
>
> The two connector halves are maintained in contact by rotating the pin housing with respect to the socket housing which rotates the pin contact 48 within the arcuate opening in the socket housing as shown in FIG. 6.

This feature can best be seen in Figures 5 and 6. From the drawings, it would appear that the socket housing is rotatable with respect to the base housing for approximately 30°, from a first position where the key can be slid through the slot to a second position where the key is "locked" into place to hold the socket and base housings together. Were such a connector employed in drill pipe/collars being mated, the rotation of the

uppermost section relative to the lowermost section would cause extreme damage to the "key" section due to the continued rotation of the uppermost section past the 30°, resulting in a failure of the very mechanism in Buck that both maintains the connection between the socket and base housings and enables quick disconnection of same.

The Applicant therefore respectfully submits that Buck does not anticipate the subject-matter of Claim 5 as amended, as Buck neither discloses nor suggests the desirability of adapting his underwater quick-disconnect mechanism to the context of threaded tubular housings such as drill pipe/collars, and the utility of said mechanism would in fact be negatively affected by attempting to use the mechanism in such a context.

Claim 6 (as amended) is addressed to the subject-matter of the original Claim 1 with the additional element of: "said plurality of electrical contacts disposed about said periphery of said male member comprising first and second plug contacts, electrically coupled to each other via plug-side current direction-limiting means; said plurality of electrical contacts disposed about said inner periphery of said receptacle means comprising first and second socket contacts, situate in said receptacle means and adapted to correspondingly come into electrical contact respectively with said plug contacts when said plug means is properly and fully matingly engaged with said socket means, said first and second socket contacts electrically coupled to each other via socket-side current direction-limiting means; at least one additional plug contact and socket contact on each of said plug and socket means, respectively, each similarly adapted to come into electrical contact with each other when said plug means is fully matingly engaged with said socket means; wherein said plug and socket means are each adapted to be used with circuit isolation means capable of only permitting flow of electrical current through said at least one additional plug and socket contact when current flow through at least one of said plug side and socket side current direction-limiting means is detected." At no point in Buck is such subject-matter disclosed, nor is the desirability of such a modification ever expressed. The subject-matter is clearly directed to contexts wherein electrical contacts pass across each other numerous times prior to full mating of the plug and socket means, as is the case with threaded connections, which is not the context addressed by Buck. In Claim 6, the flow of electrical current is only enabled

upon full mating engagement, which addresses a problem specific to certain mating connections distinguishable from the mating connection of Buck.

The Applicant therefore submits that Buck does not anticipate the subject-matter of Claim 6 as amended, as the reference neither discloses nor suggests such subject-matter, nor is it directed to subject-matter where such a feature would be desirable.

Also, the Examiner rejected Claims 8 to 19 as being anticipated by Buck, including "the mating drill pipe". However, as stated above, the teaching of Buck is not addressed to a threaded pipe context, which is the context specifically addressed in Claims 8 to 19 (as amended), Buck instead being specifically directed to quick disconnection means in underwater cable contexts. The use of the quick-disconnect connector of Buck with threadably mating pipe would negatively affect the utility of the connector, as is clearly set out above, and the connector of Buck is explicitly not adapted for positioning within an interior of threaded tubular housings such as drill pipe or drill collars. It is therefore submitted that Claims 8 to 19 (as amended), being specifically directed to plug and socket connections employed with threaded tubular housings, cannot be anticipated by Buck.

In addition, Claims 16 and 18 (as amended) are directed to, *inter alia*, the second pressure housing having an area of restricted cross-sectional area "so as to present a surface area normal to said longitudinal axis of said first and second pressure housing so that ambient pressure within said first and second drill pipes acts on said surface area so as to cause said second housing to be biased in mating engagement with said first housing". Again, as with Claim 6, this subject-matter is neither disclosed nor suggested by Buck. In fact, such a feature would serve to inhibit the utility of the connector of Buck, as it is directed to utilizing ambient pressure to maintain tight connection between the housings. Buck, in contrast, is directed to a quick-disconnect connector, and such a feature as is claimed in Claims 16 and 18 would hamper the ability to quickly disconnect the connector in emergency situations. That being the case, Buck not only does not teach the subject-matter of Claims 16 and 18 (as amended) but in fact would not even suggest such subject-matter due to the directly

negative impact on utility.

It is therefore respectfully submitted that Buck does not anticipate Claims 1 to 6, and 8 to 19, as amended, and that such claims as amended are in condition for allowance.

Typographical Error:

Claim 19 has also been amended to correct a typographical error, namely replacing "positing" with "positioning" in step (ii).

Multiple Dependencies:

Claim 12 has been amended to remove a multiple dependency.

New Claims:

New Claims 20 to 28 are added, to more fully claim aspects of the present invention, and are believed to be in condition for allowance.

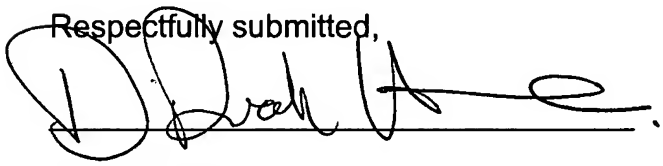
New Claim 20 is directed to self-alignment means for guiding the plug means into mating engagement with the socket means, with new Claim 21 claiming the subject-matter where the self-alignment means comprise corresponding taper interfaces on the plug means and socket means. In the disclosure, this is supported by Figures 1 to 3, which illustrate the plug means 12 having a tapered inner surface and the socket means 14 having a corresponding tapered outer surface; when the plug and socket means are brought into close proximity, the tapered interfaces assist in mating the plug and socket means.

New Claim 22 is directed to the "third biasing means" claimed in Claim 14, and claims the subject-matter where the "third biasing means" comprise a compression spring "to compensate for axial misalignment between said first and second pressure housings" (and it is clear from the disclosure at page 15 that the spring also functions to address high axial shock). As the disclosure discusses this feature primarily with regards to the pressure housings, new Claim 22 depends from Claim 15 which claims the pressure housing arrangement.

New Claims 23 and 24 depend from amended Claim 5. As Claim 5 has been amended to employ "threaded tubular housing" terminology, new Claims 23 and 24 claim the subject-matter where the threaded tubular housing is drill pipe and drill collar, respectively. Likewise, new Claims 25 and 26 depend from amended Claim 8 and claim the subject-matter where the threaded tubular housings are drill pipes and drill collars, respectively. Likewise, new Claims 27 and 28 depend from amended Claim 19 and claim the subject-matter where the threaded tubular housing is drill pipe and drill collar, respectively.

In view of the above amendments and remarks, it is believed that this application is now in condition for allowance, and a Notice thereof is respectfully requested.

Respectfully submitted,



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